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EXAMINER	
HANNETT, JAMES M	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/545,577	PELZ, JEFF B.	
	Examiner	Art Unit	
	James M. Hannett	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/7/2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/21/2005 has been entered.

Response to Arguments

Applicant's arguments filed 11/21/2006 have been fully considered but they are not persuasive. The applicant argues that Kudo et al does not teach the new limitation of "applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals". The applicant further argues that Kudo et al teaches and depicts in Figure 7, that a median filter (34) is used to filter the Green pixels and an averaging filter (31) is used to filter both the red and blue pixels.

The applicant asserts that due to the fact that the same filter process (31) is applied to both the red filters and blue filters, Kudo et al can not teach "applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals".

The examiner strongly disagrees with the applicant. Although the interpolation filters used in Kudo rely on the same filter type (31) for both red and blue pixels, the interpolation is not the only filtering performed by the camera of Kudo et al. As depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the

pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the applicants claim language is very broad and does not claim what the filtering process includes or excludes. Therefore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

Furthermore, the applicant argues that Kudo et al in view of Spaulding et al does not teach the limitation of providing a color-space transformation to the sets of pixel data signals before the step of applying the filter process.

The examiner disagrees with the applicant. Although the secondary reference Spaulding et al does not discuss the claimed filtering process discussed in Kudo et al, Spaulding et al teaches on Column 8, Liens 25-67 that it is advantageous to allow a color-space transformation to be performed in a camera when a digital image processor is located outside of the camera. Therefore, Spaulding et al teaches performing the color-space transformation process before performing various image processing techniques in order to improve image quality. Therefore, as stated in the office action it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color-space transformation process of Spaulding before the image processing (13) of Kudo et al in order to improve image quality.

The applicant should note that Examiner **Jacqueline Wilson** is no longer the examiner assigned to this case. This action and all further actions will be addressed by examiner **James M. Hannett.**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1: Claims 1-3, 6, 8, 9, 17-20, 23, 25-27, 33-36, and 39-43 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,686,961 Kudo et al.

2: As for Claim 1, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signels, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has

viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

3: In regards to Claim 2, Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel data signals within a set of radius around the individual pixel data signal (column 7, Liens 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

4: As for Claim 3, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

5: In regards to Claim 6, Kudo et al teaches the plurality of channels comprises a red channel, a green channel, and a blue channel (see Figure 7, 47).

6: As for Claim 8, Kudo et al teaches identifying the pixel data signals in each set of pixel data signals with at least a first characteristic and restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals (referred to as masking; Figure 7, step #10).

7: In regards to Claim 9, Kudo et al teaches the first characteristic is noise at or above a first threshold level (column7, Lines 48+ discloses reducing to 0 the signals other than G, R, and B

pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

8: In regards to Claim 17, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. Kudo et al teaches identifying the pixel data signals in each set of pixel data signals with at least a first characteristic and restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals (referred to as masking; Figure 7, step #10).

9: As for Claim 18, Kudo et al teaches the first characteristic is noise at or above a first threshold level (column7, Lines 48+ discloses reducing to 0 the signals other than G, R, and B pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

10: In regards to Claim 19, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel

data signals within a set of radius around the individual pixel data signal (column 7, Liens 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

11: As for Claim 20, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

12: In regards to Claim 23, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets

of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

13: As for Claim 25, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

14: In regards to Claim 26, Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel data

signals within a set of radius around the individual pixel data signal (column 7, Liens 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

15: As for Claim 27, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

16: As for Claim 33, Kudo et al teaches an image sensor apparatus (Figure 3) for capturing a digital image (6), comprising a plurality of channels with each of the channels comprising a set of pixel data signals (see input signals in Figure 7) a masking system (figure 7, step#10 which obtains image signals from the memory 20) which identifies the pixel data signals in each set of pixel data signals with at least a first characteristic (Column 7, Lines 48-51), and a filter system (Figure 7, step #20) applying a filter to the unidentified pixel data signals in each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

17: In regards to Claim 34, Kudo et al teaches the first characteristic is noise at or above a first threshold level (column7, Lines 48+ discloses reducing to 0 the signals other than G, R, and B pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

18: As for Claim 35, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel

data signals within a set of radius around the individual pixel data signal (column 7, Liens 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

19: In regards to Claim 36, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

20: In regards to Claim 39, Kudo et al teaches an image sensor apparatus (Figure 3) for capturing a digital image (6), comprising a plurality of channels with each of the channels comprising a set of pixel data signals (see input signals in Figure 7) a masking system (figure 7, step#10 which obtains image signals from the memory 20) which identifies the pixel data signals in each set of pixel data signals with at least a first characteristic (Column 7, Lines 48-51), and a filter system (Figure 7, step #20) applying a filter to the unidentified pixel data signals in each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals.

21: As for Claim 40 and 42, Kudo et al teaches capturing the digital image with a sensor (Figure 3, element 3), identifying pixels in a set of pixels for the sensor with a first characteristic (processing pixels other than G, R and B pixels), storing a map of the identified pixels for the sensor (see Figure 7, step#15) and restricting the application of the filters to the pixel data signals in the unidentified pixels in the set of pixels for the sensor (referred to as masking (column 7, Lines 48+)

22: In regards to Claim 41 and 43, Kudo et al teaches the first characteristic is noise at or above a first threshold level (column7, Lines 48+ discloses reducing to 0 the signals other than G, R, and B pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23: Claims 10-12, 15, 16, 29-31 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,686,961 Kudo et al

24: As for Claim 10, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each

of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. However, Kudo et al does not teach transforming red, green, and blue channels to an achromatic and two chrominance channels.

Official notice is taken that it was notoriously well known in the art at the time the invention was made to change RGB primary color signals to R-G, B0G, and Y channels (also known as Cr,Cb,Y). In order to provide a camera with the ability to interface with devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the camera of Kudo with circuitry which can convert primary colors (RGB) into a (Cr,Cb,Y) In order to provide a camera with the ability to interface with

devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

25: In regards to Claim 11 Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel data signals within a set of radius around the individual pixel data signal (column 7, Lines 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

26: As for Claim 12, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

27: In regards to Claim 15, Kudo et al teaches identifying the pixel data signals in each set of pixel data signals with at least a first characteristic and restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals (referred to as masking; Figure 7, step #10).

28: As for Claim 16, Kudo et al teaches the first characteristic is noise at or above a first threshold level (column7, Lines 48+ discloses reducing to 0 the signals other than G, R, and B pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

29: In regards to Claim 29, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each

of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. However, Kudo et al does not teach transforming red, green, and blue channels to an achromatic and two chrominance channels.

Official notice is taken that it was notoriously well known in the art at the time the invention was made to change RGB primary color signals to R-G, B0G, and Y channels (also known as Cr,Cb,Y). In order to provide a camera with the ability to interface with devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the camera of Kudo with circuitry which can convert primary colors (RGB) into a (Cr,Cb,Y) In order to provide a camera with the ability to interface with

devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

30: As for Claim 30, Kudo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel data signals within a set of radius around the individual pixel data signal (column 7, Lines 65-column 8, Line 23; also Figure 7 show the replaced pixel is output from the filters).

31: In regards to Claim 31, Kudo et al teaches that the set of radius is different from the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [Column 7, Liens 58-64] and element 31 uses all of the signal values [column 8, Lines 10-15].

32: As for Claim 38, Kudo teaches providing a digital image (Figure 3, Element 6), the digital image comprising a plurality of channels (Figure 7 shows R, G and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (column 7, Lines 57+). As shown in Figure 7, Kudo et al' 961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. Furthermore, as depicted in Figure 11 and discussed on Columns 7, Lines 36-56, Column 8, Lines 6-28 and Column 9, Lines 4-16, after the pixels are interpolated by interpolator filter (47), the data is filtered by a bandwidth correction circuit (23) and a color balance circuit (8). Furthermore, the examiner has viewed the claim broadly so that the claimed filtering includes the color balance

filtering (8). Furthermore, as discussed on Column 9, Lines 4-16 the color balance circuit adjusts the three colors differently in order to obtain an optimum color reproduction. This total filtering process by the camera of Kudo is viewed by the examiner as applying a filter to each of the sets of pixel data wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals. However, Kudo et al does not teach transforming red, green, and blue channels to an achromatic and two chrominance channels.

Official notice is taken that it was notoriously well known in the art at the time the invention was made to change RGB primary color signals to R-G, B0G, and Y channels (also known as Cr,Cb,Y). In order to provide a camera with the ability to interface with devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the camera of Kudo with circuitry which can convert primary colors (RGB) into a (Cr,Cb,Y) In order to provide a camera with the ability to interface with devices (monitory) which have (Cr,Cb,Y) inputs. Therefore, increasing the functionality of the camera.

33: Claims 4, 5, 13, 14, 21, 22, 28, 32 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,686,961 Kudo et al in view of the applicants conceded prior art.

34: As for Claim 4 and 5, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

35: In regards to Claim 13 and 14, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

36: As for Claim 21 and 22, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the

more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

37: In regards to Claim 28, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

38: As for Claim 32, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made

to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

39: In regards to Claim 37, Kudo does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of the exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (Figure 3) at a set radius.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radius according to exposure since the longer the exposure the more noise likely increases with defective pixels. This would require more correction. Therefore, it would have been obvious to eon of ordinary skill in the art at the time the invention was made to includes adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image

40: Claims 7, 24 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,686,961 Kudo et al in view of USPN 5,805,213 Spaulding et al.

41: As for Claim 7, Kudo teaches the above invention. However, Kudo et al fails to specifically disclose using a color-space transformation to the sets of pixel signals before the step of applying a filter.

However, Spaulding et al teaches on Column 8, Lines 25-67 that it is advantageous to allow a color-space transformation to be performed in a camera when a digital image processor is located outside of the camera. Furthermore, Spaulding et al teaches the use of CIELAB for the purpose of correcting the multi channel signals of the camera system to produce the desired output signals (Column 8, Lines 53+; and Column 7, Lines 63+). Therefore, Spaulding et al

teaches performing the color-space transformation process before performing various image processing techniques in order to improve image quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color-space transformation process of Spaulding before the image processing (13) of Kudo et al in order to improve image quality.

42: In regards to Claim 24: Kudo teaches the above invention. However, Kudo et al fails to specifically disclose using a color-space transformation to the sets of pixel signals before the step of applying a filter.

However, Spaulding et al teaches on Column 8, Lines 25-67 that it is advantageous to allow a color-space transformation to be performed in a camera when a digital image processor is located outside of the camera. Furthermore, Spaulding et al teaches the use of CIELAB for the purpose of correcting the multi channel signals of the camera system to produce the desired output signals (Column 8, Lines 53+; and Column 7, Lines 63+). Therefore, Spaulding et al teaches performing the color-space transformation process before performing various image processing techniques in order to improve image quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color-space transformation process of Spaulding before the image processing (13) of Kudo et al in order to improve image quality.

43: As for Claim 46, Kudo teaches the above invention. However, Kudo et al fails to specifically disclose using a color-space transformation to the sets of pixel signals before the step of applying a filter.

However, Spaulding et al teaches on Column 8, Lines 25-67 that it is advantageous to allow a color-space transformation to be performed in a camera when a digital image processor is located outside of the camera. Furthermore, Spaulding et al teaches the use of CIELAB for the purpose of correcting the multi channel signals of the camera system to produce the desired output signals (Column 8, Lines 53+; and Column 7, Lines 63+). Therefore, Spaulding et al teaches performing the color-space transformation process before performing various image processing techniques in order to improve image quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color-space transformation process of Spaulding before the image processing (13) of Kudo et al in order to improve image quality.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Hannett whose telephone number is 571-272-7309. The examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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James M. Hannett
Examiner
Art Unit 2612

JMH
February 2, 2006

NGOC-YEN VU
PRIMARY EXAMINER